

FORM PTO-1390 (REV. 12-2001)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 047.0059	
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371				U.S. APPLICATION NO. (If known, see 37 CFR 1.5) 10/049435	
INTERNATIONAL APPLICATION NO. PCT/DE00/02702		INTERNATIONAL FILING DATE 10 August 2000		PRIORITY DATE CLAIMED 13 August 1999	
TITLE OF INVENTION Work Piece and Method for Producing and Utilizing Said Work Piece					
APPLICANT(S) FOR DO/EO/US Rudolf Marx and Horst Fischer					
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:					
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below. 4. <input type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (Article 31). 5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) a. <input type="checkbox"/> is attached hereto (required only if not communicated by the International Bureau). b. <input checked="" type="checkbox"/> has been communicated by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input checked="" type="checkbox"/> An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input checked="" type="checkbox"/> is attached hereto. b. <input type="checkbox"/> has been previously submitted under 35 U.S.C. 154(d)(4). 7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) a. <input type="checkbox"/> are attached hereto (required only if not communicated by the International Bureau). b. <input type="checkbox"/> have been communicated by the International Bureau. c. <input checked="" type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)). 9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).					
Items 11 to 20 below concern document(s) or information included:					
11. <input type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98. 12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included. 13. <input type="checkbox"/> A FIRST preliminary amendment. 14. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 15. <input type="checkbox"/> A substitute specification. 16. <input type="checkbox"/> A change of power of attorney and/or address letter. 17. <input type="checkbox"/> A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825. 18. <input type="checkbox"/> A second copy of the published international application under 35 U.S.C. 154(d)(4). 19. <input type="checkbox"/> A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4). 20. <input checked="" type="checkbox"/> Other items or information: Express Mail Label No. ET328652946US					

ATTORNEY'S DOCKET NUMBER

047.0059

21. ☒ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):

Neither international preliminary examination fee (37 CFR 1.482)
nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO
and International Search Report not prepared by the EPO or JPO..... **\$1040.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	\$890.00
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International preliminary examination fee (37 CFR 1.482) not paid to USPTO
but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **\$740.00**

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4)	\$710.00
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International preliminary examination fee (37 CFR 1.482) paid to USPTO
and all claims satisfied provisions of PCT Article 33(1)-(4) **\$100.00**

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CALCULATIONS PTO USE ONLY

Surcharge of **\$130.00** for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	\$
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Total claims	16 - 20 =		x \$18.00	\$
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Independent claims	1 - 3 =		x \$84.00	\$
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MULTIPLE DEPENDENT CLAIM(S) (if applicable)	+ \$280.00	\$
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TOTAL OF ABOVE CALCULATIONS	=	\$
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<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2	\$
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SUBTOTAL	=	\$ 1170.00
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Processing fee of **\$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).

TOTAL NATIONAL FEE	=	\$
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Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). **\$40.00** per property +

TOTAL FEES ENCLOSED	=	\$ 1170.00
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Amount to be refunded:	\$
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charged:	\$
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- b. ☐ Please charge my Deposit Account No. _____ in the amount of \$ _____ to cover the above fees.
A duplicate copy of this sheet is enclosed.
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- d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

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Purdue Law Offices
2735 N Holland-Sylvania Rd, Ste B-2
Toledo, OH 43615-1844

SIGNATURE

David C. Purdue
NAME

31,412
REGISTRATION NUMBER

**Workpiece and methods for producing and
for making use of this workpiece**

5 The invention relates to a workpiece with a substrate of ceramic, metal or polymer, the substrate having a surface which is conditioned to form a stable connection with a polymer and which is provided with a silica layer and, on top of this, with a silane coupling agent. The invention also relates to methods for producing and for making use of the workpiece according to the invention.

10 For the production of dental crowns, it is known from US patent specification 4,364,731 to sputter a silica layer onto a cleaned ceramic, metallic or polymeric substrate surface, to apply a silane coupling agent thereon, and finally to apply a polymeric end layer ("plastic veneering"). Such a coating procedure has to be completed in one location and within a very short space of time since otherwise, if
15 the silane coupling layer is left exposed, physical or chemical damage to the extremely sensitive surface can occur, for example as a result of abrasion, a macroscopic impurity, for example in the form of skin flakes, or chemical contamination of the reactive layer surface, for example by reaction with nitrogen, hydrocarbons or other air constituents. According to this method, it is not possible
20 to store and transport the workpieces coated with silica alone and those provided with silane coupling agent, and with the polymeric end coating only taking place later and/or at another location.

25 In the case of a dental crown which has been veneered in this way, routine dental work does not demand any sterility in the sense of freedom from germs. It is usually simply cleaned with ethanol. The requirement for sterility of a dental crown would also not be consistent with practice, since a dental crown, after production by the dental technician, is packed without special requirements in respect of sterility. On arrival at the dentist's surgery and before it is fitted, it is
30 handled by the dentist and by his assistant, albeit with observation of certain hygiene procedures, but also by contact with the fingers. The nature of its handling thus rules out the continuation of any sterility that might be present. When fitted in the mouth, the crown is immediately colonized by numerous germs and other microorganisms typically found in the mouth, so that any previous sterility would
35 be pointless. Even the healthy oral cavity is in fact "physiologically" heavily colonized by germs at all times. This flora is important for digestion since the

digestive process is initiated by the saliva in the mouth.

Also, in the case of such a dental crown, a polymeric coating does not in any way act as a protective layer against physical, mechanical or other stresses. It is instead
5 an aesthetic veneer (typical thickness 1 mm) for in most cases a metal crown, and sometimes also for a ceramic or polymeric dental crown. Veneering with plastic is not intended to provide a protective function for the base of the crown. For example, there is no protection against:

- 10 a) physical abrasion: mastication function (the base of the crown itself is substantially more resistant to abrasion than the polymeric veneer) or
- b) chemical influences: corrosive attack by saliva, food and medications, microbial effects, e.g. by acid excretion of bacteria (the base of the crown,
15 in particular when noble metals or ceramics are used, is substantially more stable to corrosion than is the plastic coating), or
- c) the influence of temperature changes when eating: these changes can, as a result of different coefficients of expansion, induce cyclically alternating stresses which impair the mechanical stability (the base of the crown is
20 much more resistant to these cycles than is the veneer).

It should be noted that in general (in Germany) the base of the crown is made of an alloy with a high gold content. Ni and CoCr alloys are also commonly used (also
25 known as superalloys from weapons technology), and also Pd-based alloys (only biocompatible to a limited extent; these economy alloys are controversial since they have a high allergy potential) or unalloyed titanium (except for the colour and the difficult processing, they are equal to gold alloys in terms of the above aspects). All the alloys are configured for oral stability and this is guaranteed in
30 particular in the case of alloys having a high gold content. The plastic veneering as a measure for improving aesthetics does not provide additional oral stability; nor is this the intention. On account of their material properties, plastics are in fact less stable in principle in the mouth than are highly corrosion-resistant metals or ceramics.

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The plastic veneers are primarily used for the temporary and removable tooth

replacement (possibility of repair, given the high abrasion and cracking of the plastic).

5 The dental crown produced with the layer system of "substrate, silica layer, silane layer, plastic veneer" thus represents a finished product which can be used in this form in the patient.

10 The object of the present invention now is to make available a workpiece in the form of a semi-finished product, in particular a semi-finished implant or semi-finished prosthesis, with a good capacity for bonding to at least one component of a multi-component adhesive to be applied thereon, the semi-finished product being intended to have a surface which can remain sterile until the later application of the adhesive component and which is suitable for storage and also for transportation.

15 Methods for producing and for making use of the workpiece according to the invention are also provided.

20 According to the invention, in the case of a workpiece of the type mentioned in the introduction, the object is achieved by the fact that the substrate, the silica layer and the silane coupling agent are sterile, and that, on top of the silane coupling agent, there is a preserving protective layer which is sterile and/or can be sterilized after polymerization and which constitutes the activatable first component of a multi-component adhesive which at the time of use is formed by addition of at least one further adhesive component.

25 For the layered structure between substrate and protective layer and multi-component adhesive, freedom from germs is absolutely imperative, unlike the case of the dental crown, since, once the layer system of the semi-finished product is finished, any germs which may possibly be present in the layer system can no longer be removed. Only with a layer system that has been prepared in this way is it possible to guarantee friction-free use, e.g. as hip prosthesis or knee prosthesis. If the layer structure is not germ-free, there is a risk of infections in the body, which must absolutely be avoided. Such infections are difficult to combat especially as the patient's resistance is weakened as a result of the intensive surgical procedure.

30 The infection may possibly result in the first hip endoprosthesis having to be removed in an extensive surgical procedure, measures being taken to combat the

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infection, and a second hip endoprosthesis being implanted. It must be noted at this point that such a hip operation can only be carried out a maximum of three to four times on any one patient.

- 5 By means of the preserving protective layer, the silane coupling agent is chemically sealed off and consequently can no longer be physically or chemically contaminated. The layer thickness of the protective layer is additionally sufficient to withstand a small amount of friction. A workpiece is thus made available which can be stored and transported. Larger numbers of semi-finished products can thus
10 be produced at one production site and later provided with the additional adhesive component/components at another site. Since the semi-finished product according to the invention is intended to be produced at a small number of high-tech central production sites and then dispatched to the users, e.g. hospitals at home and abroad, storage periods of several months may pass before the workpieces can be
15 surgically implanted. Throughout this period, which can easily span six to twelve months, the sterility of the workpiece must be guaranteed.

- Upon use, the protective layer, which is not an end layer but instead an adhesive component of a multi-component adhesive, can be coated in situ with a second
20 adhesive component, e.g. a sterile MMA monomer, and thereby activated. Directly thereafter, these two components are then brought into contact with a third adhesive component, a polymeric adhesive.

- Also according to the invention, the sterile and/or sterilizable preserving protective
25 layer can be made of polymethyl methacrylate. Such a protective layer is particularly expedient in medicine if the workpiece is to be fitted as an implant in a bone.

- Also according to the invention, the sterile and/or sterilizable preserving protective
30 layer can be made of BisGMA. A protective layer made of BisGMA is particularly intended for use in dentistry.

- Also according to the invention, the preserving protective layer can be made of
35 epoxy resin. A protective layer made of epoxy resin is particularly intended for use in the technical non-biological sector.

Also according to the invention, the preserving protective layer can be made of phenolic resin. A protective layer made of phenolic resin is particularly intended for use in the technical non-biological sector.

5 Also according to the invention, the sterile and/or sterilizable preserving protective layer can have a thickness of $< 100 \mu\text{m}$. A thin protective layer such as this can be activated very quickly by wetting with a corresponding monomer. This layer is also chosen to be sufficiently thick to provide protection against abrasion during transportation.

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Also according to the invention, the substrate can have a surface conditioned to form a stable connection to a polymeric adhesive.

Also according to the invention, the workpiece can be used in moist warm media.

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Also according to the invention, the workpiece can be used as an implant or prosthesis or as a component of an implant or prosthesis in medicine. This relates in particular to implants in the form of sterile and/or sterilizable, coated hip endoprosthesis shafts, knee-joint prosthesis shafts and other joint prosthesis shafts.

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The invention also relates to a method for producing a workpiece of the above type, in which the surface of the substrate is cleaned, a silica layer is then applied using a high-vacuum evaporation unit and is then wetted with a silane coupling agent. After the substrate surface has been cleaned, carboxyl groups can be generated thereon by means of a low-pressure plasma process. In order to preserve the surface which has been treated in this way, with the silica layer and the silane coupling agent, until further processing, a sterile and/or sterilizable preserving protective layer is applied as the activatable first component of a multi-component adhesive which at the time of use is formed by addition of at least one further

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30 adhesive component. The substrate surface, which has usually already been pre-cleaned, thus undergoes further cleaning by means of the low-pressure plasma process. By selection of a suitable plasma gas, carboxyl groups can be generated on the cleaned substrate surface for activation, which greatly increases the adhesive bonding strength. By applying a sterile and/or sterilizable preserving

35 protective layer, workpieces are produced which can be stored and transported.

Also according to the invention, the vapour-deposition of the silica layer can be effected in a reproducible manner using a shutter system. It is additionally possible to provide a tri-axial unit with which a silica layer of constant thickness can be realized on a complex 3D surface.

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The invention also relates to a method for making use of a workpiece of the above type, where the workpiece, after sterile intermediate storage, is first provided on its conditioned surface with a monomeric adhesive component in order to activate the protective layer and a polymeric adhesive component is then applied on top of this, these two adhesive components forming a multi-component adhesive together with the protective layer. By means of the activation of the preserving protective layer with the monomeric adhesive component, the protective layer can chemically react with the polymeric adhesive component layer which is to be applied. By storing the workpiece under sterile conditions, for example under He or N₂ protective gas in a gastight blister pack, it can be stored for a number of months until further processing.

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The workpiece according to the invention and the methods for producing and for making use of said workpiece are explained below with reference to a hip endoprosthesis shaft:

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A low-pressure plasma process is used to generate carboxyl groups on a cleaned metallic shaft of a hip endoprosthesis, which carboxyl groups increase the adhesive bonding strength of a silica layer which is to be vapour-deposited onto it. This silica layer is preferably wetted in a monomolecular manner with a silane coupling agent, and a sterile and/or sterilizable preserving protective layer is then applied thereon.

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The hip endoprosthesis which has been produced in this way consequently has a metallic shaft with a silica layer, on top of this a layer of silane coupling agent, and a final sterile and/or sterilized preserving layer (first adhesive component).

30

After production, the hip endoprosthesis according to the invention is packed in a sterile manner, for example in a gastight blister pack filled with He or N₂ protective gas. In this way it is protected from contamination and can be transported and also stored for a number of months without any loss of quality.

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The coated shaft of the hip endoprosthesis is then removed from the sterile pack in site under sterile conditions in the operating theatre and coated with a sterile MMA monomer (further adhesive component). The sterile preserving protective layer is activated in this way. Directly thereafter, the shaft is inserted into a bone cavity
5 filled with the polymeric adhesive (bone cement = further adhesive component). After the adhesive sets, a connection between the adhesive and the hip endoprosthesis shaft is obtained which has a high degree of adhesive bonding and is stable for a long period of time in the moist and warm conditions within the body.

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Claims

1. Workpiece with a substrate of ceramic, metal or polymer, the substrate having a surface which is conditioned to form a stable connection with a polymer and which is provided with a silica layer and, on top of this, with a silane coupling agent,
5 characterized in that
10 - the substrate, the silica layer and the silane coupling agent are sterile, and
- on top of the silane coupling agent, a preserving protective layer which is sterile and/or can be sterilized after polymerization is provided as the activatable first component of a multi-component adhesive which at the
15 time of use is formed by addition of at least one further adhesive component.
2. Workpiece according to Claim 1, characterized in that the sterile and/or sterilizable preserving protective layer is made of polymethyl methacrylate.
20
3. Workpiece according to Claim 1, characterized in that the sterile and/or sterilizable preserving protective layer is made of BisGMA.
4. Workpiece according to Claim 1, characterized in that the preserving
25 protective layer is made of epoxy resin.
5. Workpiece according to Claim 1, characterized in that the preserving protective layer is made of phenolic resin.
- 30 6. Workpiece according to one of the preceding claims, characterized in that the sterile and/or sterilizable preserving protective layer has a thickness of $< 100 \mu\text{m}$.
- 35 7. Workpiece according to one of the preceding claims, characterized in that the substrate has a surface conditioned to form a stable connection to a polymeric adhesive.

8. Workpiece according to one of the preceding claims, characterized in that it is used in moist warm media.
- 5 9. Workpiece according to one of the preceding claims, characterized in that it is used as an implant or prosthesis or as a component of an implant or prosthesis in medicine.
- 10 10. Method for producing a workpiece according to one of the preceding claims, in which the surface of the substrate is cleaned, a silica layer is then applied using a high-vacuum evaporation unit and is then wetted with a silane coupling agent,
- 15 characterized in that
- after the substrate surface has been cleaned, carboxyl groups are generated thereon by means of a low-pressure plasma process, and
- 20 in order to preserve the surface which has been treated in this way, with the silica layer and the silane coupling agent, until further processing, a sterile and/or sterilizable preserving protective layer is applied as the activatable first component of a multi-component adhesive which at the time of use is formed by addition of at least one further adhesive component.
- 25 11. Method for producing a workpiece according to Claim 10, characterized in that the vapour-deposition of the silica layer is effected in a reproducible manner using a shutter system.
- 30 12. Method for making use of a workpiece according to one of the preceding claims,
- characterized in that
- 35 after sterile intermediate storage, the workpiece is first provided on its conditioned surface with a monomeric adhesive component in order to activate the protective layer, and a polymeric adhesive component is then

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applied on top of this, these two adhesive components forming a multi-component adhesive together with the protective layer.

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DECLARATION FOR UTILITY OR DESIGN PATENT APPLICATION (37 CFR 1.63) <input type="checkbox"/> Declaration Submitted with Initial Filing OR <input type="checkbox"/> Declaration Submitted after Initial Filing (surcharge (37 CFR 1.16 (e)) required)	Attorney Docket Number	
	First Named Inventor	
	COMPLETE IF KNOWN	
	Application Number	/
	Filing Date	
	Group Art Unit	
		Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

WORK PIECE AND METHOD FOR PRODUCING AND UTILIZING SAID WORK PIECE

the specification of which (Title of the Invention)

☐ is attached hereto OR

☒ was filed on (MM/DD/YYYY) **08/10/2000** as United States Application Number or PCT International Application Number **PCT/DE00/02702** and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
199 37 864.9	DE	08/13/1999	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below

Application Number(s)	Filing Date (MM/DD/YYYY)

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(Page 1 of 3)

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DECLARATION — Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application

U.S. Parent Application or PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
PCT/DE00/02702	08/10/2000	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

☐ Customer Number

OR

☐ Registered practitioner(s) name/registration number listed below

Place Customer Number Bar Code Label here

Name	Registration Number	Name	Registration Number

☐ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet PTO/SB/02C attached hereto.

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Country		Telephone		Fax	

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Rudolf		Marx	
Inventor's Signature	Date		
Residence: City		State	Country
Eichenbach		DE	
Post Office Address		Citizenship	
Ahrthalstraße 31		DE	
Post Office Address			
53533 Eichenbach			
City	State	ZIP	Country
	DE		

☒ Additional inventors are being named on the _____ supplemental Additional Inventor(s) sheet(s) PTO/SB/02A attached hereto

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DECLARATION	ADDITIONAL INVENTOR(S) Supplemental Sheet Page <u>3</u> of <u>3</u>
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Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Horst <i>2-00</i>		Fischer	
Inventor's Signature	<i>Horst Fischer</i>		Date <i>17 May 02</i>
Residence: City	Aachen	State	DE
Post Office Address		Melatener Weg 20	
Post Office Address		52074 Aachen	
City		State	DE
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature			Date
Residence: City		State	
Post Office Address			
Post Office Address			
City		State	
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Inventor's Signature			Date
Residence: City		State	
Post Office Address			
Post Office Address			
City		State	

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